11.1.99.

Dear Dr Henney –

I am a busy mother – I never have time to write letters like this – but this issue is so important, I had to make the time. 2389

This is a no brainer. Why are we allowing antibiotics to be used in livestock in the cavalier manner? (see article.) Why not err on the safe side? Please help make our food safer. This is a huge issue. Let me know if I can help you do this important job.

Sincerely,

Helen Thomas

H Thomas
933 Roscomare RD
Los Angeles, CA 90077-2225

Winner of the Utne Reader Alternative Press Award: General Excellence in Newsletters

The Green Guide

September 1999 ENVIRONMENTAL CHANGE BEGINS AT HOME NUMBER 71

MAKING NEWS

TOXIC PESTICIDE RESTRICTED

In August, the Environmental Protection Agency announced a partial ban on the use of the broad-spectrum insecticide methyl parathion, targeting foods commonly eaten by children, including all fruits, carrots, fresh peas and beans, and tomatoes. Methyl parathion, a widely used organophosphate pesticide (OP), is neurotoxic to humans and kills birds, aquatic life, and honey bees.

The action was the Agency's first major step under the Food Quality Protection Act of 1996, under which 10,000 pesticide uses must be reviewed for their impacts on children's health. Consumers Union responded by criticizing EPA for failing to take any action on most of the 125 riskiest pesticides used on food. Methyl parathion will continue to be allowed on corn, oats, rice, soybeans, sugar beets, wheat, potatoes, and other foods.

[EPA Fact Sheet, 8/2/99; The Washington Post, 8/3/99]

CARBON EMISSIONS STABILIZE

Global emissions of man-made carbon dioxide (CO_2) declined slightly last year for the first time since 1993, estimates the Worldwatch Institute. CO_2, created when oil, gas and other fossil fuels are burned, has been blamed for global climate change. Worldwide CO_2 emissions fell 0.5% last year, even though the world economy expanded 2.5%. Despite the 4% growth in the U.S. economy, emissions rose only 0.04%.

If it holds, this trend may help temper the debate among countries who have associated lowering their emissions — mandated by the International Kyoto Protocol on global warming — with lowered productivity and/or higher costs. Worldwatch credits the expansion of the information sector and better energy-efficiency, in part, for the curb in CO_2 releases. Still, worldwide emissions of CO_2 totaled 6.32 billion tons in 1998, and the U.S. Congress has yet to ratify the Kyoto Protocol.

[Worldwatch News Brief, 7/27/99; The Wall Street Journal, 8/2/99]

TENTH ANNUAL BIONEERS CONFERENCE

Since 1990, Bioneers — a project of the Collective Heritage Institute in New Mexico — has assembled a group of environmental pioneers to share strategies for environmental restoration. This year's event, to be held in Marin County, California, from October 29-31, will include workshops on big organic farming, environmental justice, the media, urban restoration, cancer prevention, genetic engineering, green design, and more. On Friday, October 29, *Green Guide* editor Mindy Pennybacker will be discussing environmental health threats to women and children.

(Mothers & Others members receive a 5% discount. www.bioneers.org, 877/246-6337) —*KE*

Illustrations: Alexis Spakoski

Who's to blame when antibiotics don't work?

BY NICOLS FOX

Novelist Anne Bronte and poet John Keats died of tuberculosis. President William Henry Harrison died of pneumonia after falling ill at his inauguration only a month earlier. The threat of bacterial infection once hung, not simply over the heads of its more famous victims, but over every ordinary family.

Today we expect that infections can be quickly and effectively treated with antibiotics. Improvements in public sanitation, personal hygiene and nutrition made a huge difference in combating infectious disease. But it was the discovery and development of antibiotics in the 1930's that gave physicians effective tools against typhoid, pneumonia, meningitis, tuberculosis and other vicious infections.

Now the frightening reality is that the usefulness of these "wonder drugs" is seriously threatened by the growing problem of what to do when bacteria no longer respond to commonly used antibiotics. Penicillin, for example, can no longer fight 25% of infections caused by *Streptococcus pneumoniae*, the leading cause of bacterial pneumonia, meningitis and ear infections in the U.S., the U.S. Centers for Disease Control & Prevention (CDC) announced last month. In some regions of the country, resistance has reached 38%. And an antibiotic-resistant strain of *Staphylococcus aureus*, a common cause of serious infections in hospitals, has killed four children and sickened more than 200 people in South Dakota and Minnesota over the past two years, CDC also reported on August 20, 1999.

"We are now entering a post-antibiotic era," says J. Glenn Morris, M.D., a professor of medicine at the University of Maryland. Overuse and misuse of antibiotics, by physicians, patients, farmers and hospitals, is creating resistance that can pass from human to human, animal to human. And resistant bacteria are spreading in the environment itself, in water and wildlife.

A competitive environment

Bacteria, microscopic one-celled organisms, live on and in the human body in astonishing numbers. Most are harmless or even helpful — some of the 400 different species in the colon aid digestion and the immune system. To cause harm, disease-causing bacteria must penetrate a strong line of defenses, beginning with skin and mucous membranes. Pathogens may survive in the body without causing illness if there is enough competition from other bacteria to hold them in check. Serious exposure, however, can overwhelm the body's defenses.

In 1928, Sir Alexander Fleming, a British doctor, accidentally discovered a mold that killed Staph. Professor Howard Florey and Ernest Chain, M.D., developed the powerful drug penicillin from that mold in England during World War II. Since then, over 100 antibiotic drugs have been developed. They work by sabotaging the bacterial cell wall, stopping multiplication, or defusing cell functions in other ingenious ways. Broad-spectrum antibi-

—continued on next page

otics, such as cephalosporins and penicillin derivatives, can topple a large number of bacterial species; others target particular organisms, as does Cortisporin for "swimmer's ear."

The most antibiotic-prescribed population in the U.S. are kids under age six, according to Drs. Paul A. Offit and Bonnie Fass-Offit, authors of *Breaking the Antibiotic Habit*. This makes children, especially those receiving decent medical care, more likely to be infected by antibiotic-resistant bacteria.

The Specter of Resistance

When a bacterium survives antibiotic treatment and multiplies after developing some defensive strategy for evading the action of the drug, resistance develops. Bacteria can also transfer resistance genes to one another and even other bacterial species. Use of broad-spectrum antibiotics can lead to serious trouble by wiping out microbial competition, leaving the strong, resistant bacteria behind to multiply unchecked.

Until the 1980's, new antibiotics steadily filled up space in the medicine cabinet. "Now that shelf is almost empty," according to Patricia B. Lieberman, Ph.D. and Margo G. Wootan, D.Sc., co-authors of a 1998 Center for Science in the Public Interest (CSPI) report, "Protecting the Crown Jewels of Medicine." The usefulness of these antibiotics is diminishing as more and more pathogenic bacteria are showing resistance to one, two and sometimes a whole range of antibiotics.

Tuberculosis, for one, was considered a disease of the past. But by 1992, 10% of TB cases were caused by new strains of multidrug-resistant tuberculosis (MDRTB), made worse by a relaxation of public health vigilance and an ever-increasing population of the immune-compromised. From 40% to 80% of MDRTB patients die, depending on their immune status, note Lieberman and Wootan.

At the same time, methicillin-resistant *Staphylococcus aureus* (MRSA) worried scientists who feared the strain might develop resistance to vancomycin, the antibiotic of last resort. (Methicillin is related to penicillin.) Today more than 90% of *S. aureus* are resistant to penicillin, and the incidence of MRSA increased from 2.4% to 29% between 1975 and 1991. What's worse, strains of vancomycin-resistant *S. aureus* have surfaced around the globe. "If untreatable *Staph* should emerge, it would certainly close down hospitals," says Fred Angulo, D.V.M., Ph.D., medical epidemiologist at CDC's National Center for Infectious Diseases.

Modern travel and trade mean that contact with a resistant pathogen is a handshake, an airplane ride, a hospital visit away. Antibiotic use on fruit trees — up to 300,000 pounds per year in the U.S. — may encourage the growth of resistant bacteria on fruit, which ultimately wind up in our stomachs.

Resistant bacteria are also flowing down major U.S. rivers, according to three studies presented at the 1999 American Society for Microbiology's annual meeting. At some test sites up to half the bacteria found were resistant to one or more commonly used antibiotics, such as ampicillin. Another study found that Canadian geese living year-round in the Chicago suburbs harbored multiple strains of bacteria resistant to a wide assortment of commonly used drugs, possibly picking up bacteria from contaminated water.

Who's Responsible?

Using antibiotics for livestock

A likely source of antibiotic resistance is drug overuse in livestock. Antibiotics added to feed or water deliver regular doses that prevent infections and promote faster growth. For foodborne pathogens such as *Salmonella, Campylobacter* and *E. coli* O157, "...the most likely source of most antimicrobial resistance is use of antimicrobials in food producing animals," reports a December 1998 Food & Drug Administration evaluation of antibiotic use in livestock. And antibiotics and resistant bacteria can enter waterways in manure runoff. Resistant pathogens may be transferred to those who handle or consume raw or undercooked animal products.

That's what happened to the Heyers, a dairy farm family in Vermont, in 1997. After drinking unpasteurized milk from a sick cow, they contracted *Salmonella* DT104, a strain resistant to five antibiotics, including ampicillin and tetracycline. Marjorie Heyer's adult daughter Cynthia Hawley nearly died when conventional antibiotic treatment failed. When the strain was properly identified, she was given Ofloxcin, a fluoroquinolone to which it was not resistant.

The fluoroquinolones, a newer class of antibiotics, are important in treating human disease. Despite evidence that their use in agriculture had led to the development of fluoroquinolone-resistant bacteria in the United Kingdom, they were approved by the FDA in 1995 for use in poultry drinking water. "Big mistake," says CSPI's Lieberman. Turkeys and chickens are now turning up in U.S. supermarkets harboring *Campylobacter,* the most common cause of foodborne disease in the U.S., resistant to fluoroquinolones, according to a report from the Minnesota State Department of Health. "Unfortunately, a lot of antibiotics are used in agriculture solely for economic (not health) reasons to promote the growth of animals," says Dr. Angulo. "The U.S. has the most liberal and uncontrolled drug use policy of any developed country," he adds.

"Antibiotics are added to livestock feed to counteract the effects of crowded living conditions and poor hygiene," says Richard Wood, executive director of Food Animal Concerns Trust (FACT). "If farmers pro-

Another Worry:
Splicing Antibiotic Resistance Into Food

Genetically engineered foods sometimes include marker genes that code for antibiotic resistance. These help bioengineers identify which plants have been successfully modified, since surviving the application of the antibiotic to which they are resistant shows that the splicing actually took place. Some scientists worry that these markers will escape into the environment and pass on resistance traits to disease-causing bacteria.

Novartis uses marker genes for resistance to ampicillin in corn engineered to be resistant to the European corn borer. The company claims that "transference cannot be ruled out as a theoretical possibility, but it has never been achieved in the laboratory and must be considered extremely unlikely." In its September 1998 draft guidance on the use of antibiotic-resistant marker genes, the FDA said it also considers such transfer between plant cells and bacteria unlikely.

Others disagree. The British Medical Association recommends that further tests be conducted before such modified crops are unleashed. "Antibiotic resistance genes are not a huge risk, but they are not a risk we need to take given that other marker genes can be used," says Rebecca Goldburg, Ph.D., of Environmental Defense Fund.

How would eating these plants affect a person taking an antibiotic? Studies by Calgene, which engineered the "Flavr Savr" tomato, found that high consumption of foods containing the antibiotic-resistant marker could inactivate a small fraction of a low, oral dose of antibiotic.

—NF

vide cleaner barns, better feed, and more floor space per animal, they can reduce stress and illness while maintaining growth," he says.

Europeans are phasing out antibiotics used by humans as a regular animal feed ingredient amid strong protests and lawsuits from feed and drug companies. "But in the U.S., instead of reducing uses of antibiotics in livestock, we are still expanding into new uses," says Lieberman. In March 1999, CSPI and 40 other organizations filed a petition with the FDA asking that antibiotics important for treating humans, such as penicillin, tetracycline and erythromycin, be eliminated from "sub-therapeutic use" in animals, including growth promotion or disease prevention, echoing World Health Organization advice.

Antibiotic resistance concerns Stephen F. Sundlof, D.V.M., Ph.D., director of the Center for Veterinary Medicine at the FDA, who says the issue is his "first priority." He doesn't agree that a ban on certain antibiotics is necessary. "Judging antibiotics on a case-by-case basic would be more thorough," says Dr. Sundlof.

To complicate matters further, the FDA doesn't know how much of the antibiotics produced by drug companies actually go to animals. Most experts agree that agricultural use of antibiotics accounts for around 40% of the total. The FDA is seeking authority to get that information, currently considered proprietary by industry. Legislation might be needed, and restricting use in animals is likely to go slow. "The agriculture, drug and feed industries will try and stall endlessly," says Lieberman.

Meanwhile, the National Antimicrobial-Resistance Monitoring System is working with the CDC and the U.S. Department of Agriculture looking for resistance in the samples taken at slaughterhouses.

Overprescribing antibiotics for people

Misuse of antibiotics by humans is another major cause of resistance. Physicians hand out antibiotics too frequently, according to the CDC, which estimates that some 50 million of the 150 million outpatient prescriptions for antibiotics every year are unnecessary. "At a seminar I conducted, more than 80 percent of physicians present admitted to having written antibiotic prescriptions on demand against their better judgment," wrote Stuart Levy, M.D., director of Tufts University's Center for Adaptation Genetics and Drug Resistance, in the March 1998 issue of *Scientific American*. Patients often demand antibiotics for nonbacterial illnesses such as colds, caused by viruses on which antibiotics have no effect.

The CDC believes it can, through education of physicians and patients, have an impact on the way antibiotics are prescribed. In trials, physicians are promoting what they call "judicious treatment," such as culturing to identify the bacterial strain causing an infection and limiting use of broad-spectrum antibiotics.

Looking back, the great era of the antibiotic was tantalizingly brief. That ambitious notion that humans could control infectious diseases lasted a mere 30 years. Today, as nature bounces back from the antibiotic assault, there is no such complacency. Overuse, misuse and outright abuse may deprive us of one of the greatest achievements in medicine.

Nicols Fox is an independent journalist and the author of two books on foodborne disease: ***Spoiled*** *(Penguin, 1998, $14.95) and the just-released* ***It Was Probably Something You Ate*** *(Penguin, 1999, $12.95).*

What you can do

- **Don't insist that your physician prescribe an antibiotic for nonspecific or viral illnesses.** Use antibiotics precisely as prescribed and for the duration directed, even if symptoms subside.
- **Wash all raw fruits and vegetables thoroughly,** and wash hands before and after preparing food, to prevent the spread of resistant bacteria.
- **Choose meat that's labeled "no antibiotics used,"** such as 100% certified organic.
- **Avoid the use of antibacterial soaps** and other products containing triclosan (Microban™), unless treating a seriously ill patient, as bacteria can become resistant, according to a study in the April 1999 *Journal of Biological Chemistry.*
- **Write the FDA to support the CSPI petition** against sub-therapeutic uses of antibiotics in livestock: *Jane Henney, M.D. Commissioner, U.S. Food & Drug Administration, 5600 Fishers Lane, Room 1471, Rockville, MD 20857.*

Resources

- Alliance for the Prudent Use of Antibiotics, www.healthsci.tufts.edu/apua
- FACT, 773/525-4952
- CSPI, 202/332-9110, www.cspinet.org
- CDC, www.cdc.gov/ncidod/ar
- *Breaking the Antibiotic Habit: A Parent's Guide to Coughs, Colds, Ear Infections and Sore Throats*, by Drs. Paul Offit and Bonnie Fass-Offit (Wiley, 1999, $12.95).

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Antibiotic Resistance On the Rise

NEXT: Biotechnology and American Consumers

Letters from Readers

http://www.mothers.org

I was pleased to see an article about meat in The Green Guide #68 [June 1999]. *I am in agreement with your point of view, which may come as a surprise as I am a meat producer. We are a small family farm, and raise 140 beef cattle per year organically and ethically. We are in a similar situation to Fred Kirschenmann. We utilize Vermont mountain pastures that are unsuitable for crops; they would grow up to brambles or have to be mowed if the cattle weren't on them.*

An issue that really needs to be looked at is how animals are slaughtered [see GG#51]. *The reason the U.S. Department of Agriculture is pushing for meat irradiation is because the big slaughterhouses are so filthy. We have the other side to the slaughter story — our animals are handled humanely. We use a very small, clean slaughterhouse that only handles about 12 cattle per week, versus thousands that go through the large slaughterhouses.*

—Leslie Carlson, North Hollow Farm
802/767-4255, nhollow@sover.net

Are polycarbonate plastic baby bottles safe?
— Peter DeMacarty, CA

Polycarbonate, a clear and rigid plastic, is made from bisphenol-A (BPA) — a suspected hormone disruptor that can alter the body's normal hormonal activity. In 1999, Consumers Union, replicating 1997 U.S. Food & Drug Administration tests on baby bottles, found that polycarbonate bottles release about 1 part per billion (ppb) of BPA into an infant formula simulant when boiled for a half hour. Using a different method, researchers at Nagasaki University in Japan found that new polycarbonate bottles, filled with distilled water then heated, leached from 1 to 3.5 ppb of BPA. Used bottles leached up to nearly double this amount.

Several studies show that such low doses cause estrogen-like effects in animals, as documented in *Our Stolen Future* (Penguin, 1997). One, conducted by Frederic vom Saal at the University of Missouri, found changes in reproductive organ size and sperm production of male offspring of mice that were fed very low doses of BPA during pregnancy. These studies indicate that there may not be an adequate margin of safety between the amount of BPA that an infant receives from bottles and the amount that affects animals, according to Edward Groth, Ph.D., of CU.

◆ **BPA-free, polypropylene options:** EVENFLO's glass and colored plastic bottles, 800/356-BABY; all MEDELA bottles, 800/TELL-YOU; all colored GERBER bottles, 800/4-GERBER.

Breast Cancer Update

It's nearly October, when pink ribbons, races for the cure, and mammography reminders signal the arrival of National Breast Cancer Awareness Month (NBCAM). "Early detection is your best protection — get a mammogram now," harp the event's promotional brochures. But women's best protection — prevention — may lie in the information consistently omitted by NBCAM, which was founded by the company Zeneca Group PLC (see *GG*#60).

As manufacturer of the leading breast cancer treatment drug tamoxifen (Nolvadex™), and as operator of the Salick cancer care centers, Zeneca clearly has a vested interest in cancer detection. The company also makes the herbicide acetochlor, a probable human carcinogen, and other pesticides and industrial chemicals. It's no surprise that environmental links to cancer are never mentioned in NBCAM literature or at their events.

The Toxic Links Coalition has renamed October "Cancer Industry Awareness Month." Bearing slogans such as "Stop Cancer Where it Starts" and "Save Lives, Not Profit Margins," activists around the country are demanding that researchers and the U.S. government turn their attention to the causes of cancer and to prevention, rather than focusing solely on treatments. To counteract NBCAM's phony philanthropy, participate in one of the following alternative events or actions this October.

◆ Oct. 15-16, St. Paul, MN, Conference: "Turning the Tides II: Environmental Action for Cancer Prevention," WOMEN'S CANCER RESOURCE CENTER, 612/729-0491. ◆ Oct. 23, Boston, MA, Conference: "At the Heart of Primary Prevention: Breast Cancer and the Precautionary Principle," MASSACHUSETTS BREAST CANCER COALITION, 800/649-MBCC. ◆ Oct. 27, San Francisco, CA, Rally: "TOXIC LINKS COALITION's Cancer Industry Tour." In its sixth year, the Tour spotlights polluting companies and the agencies and PR firms that protect them, 415/243-8373, x305. (Also call for guidance in starting a tour in your area.) ◆ Oct. 30, San Francisco, CA, Strategy Meeting: "Corporate Stakes in the Breast Cancer Epidemic," BREAST CANCER ACTION. BCA also provides flyers to copy and distribute at NBCAM events, educating people about its deceptive nature, 877/2-STOP-BC, www.bcaction.org. To locate NBCAM events in your area, call 888/80-NABCO or visit www.nbcam.org ◆ To add your name to the BREAST CANCER FUND's activist constituency, call 800/487-0492, www.breastcancerfund.org

—*AS*

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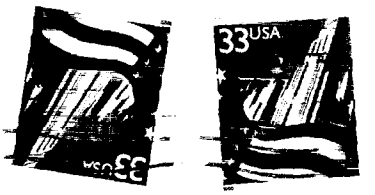

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